

THE LIFE HISTORY OF *LIBYTHEA GEOFFROY NICEVILLEI* OLLIFF (LEPIDOPTERA: LIBYTHEIDAE)

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Abstract

The life history of *Libythea geoffroy nicevillei* Olliff is described and brief comments on adult and larval behaviour are presented. The host plant *Celtis paniculata* (Endl.) Planch. (Ulmaceae) is recorded for the first time.

Introduction

Libythea geoffroy Godart is the sole representative of the Libytheidae occurring in Australia. Little is known of its habits and biology although observations have been made on *L. g. genia* Waterhouse from north-western Australia (Common and Waterhouse 1981). The eastern Australian subspecies *L. g. nicevillei* Olliff has rarely been encountered.

During a trip to Mt White near Coen, Cape York Peninsula, in January 1988, the authors observed numerous adults of both sexes and discovered the life history.

Life History

Food plant. *Celtis paniculata* (Endl.) Planch. (Ulmaceae).

Egg (Fig. 1). Pale cream, bullet shaped, micropyle flat, and surrounded by 10 - 11 projecting flanges, each of which gives rise to a serrated vertical rib running the length of the egg; each major rib becomes bifurcated or trifurcated; fine striations between the ribs; 0.65 mm high and 0.4 mm wide laid singly on a young bud deep within an axil or occasionally in a small crack in a twig of the host plant. Duration 2-3 days.

Larva (Fig. 2). 1st instar: head dark brown, body cylindrical, pale green and covered in fine pubescence; legs and prolegs black; length 1 mm. 2nd instar: similar to 1st instar but head becoming pale green with ocelli and clypeus black. 3rd instar: head and body pale yellow green; ocelli and mandibles black; a broad ventrolateral brown line; a prominent lateral yellow line; ventral surface white; body covered in fine hairs. 4th-5th instars: head with basal two thirds black and sharply demarcated from pale yellow dorsal one third; thoracic and terminal abdominal segments yellowish; remainder of body greenish black and covered in fine hairs; anal plate with a triangular brown patch; each segment with a transverse row of small silver spots; ventral surface white and visible laterally as a series of prominent

white patches antero-dorsally to the prolegs; a pale yellow lateral line faintly edged white. Larval duration 11 - 13 days.

Pupa (Fig. 3). Pale green or occasionally pale brown; suspended by the cremaster at an acute angle beneath a leaf of the host plant; thorax with a bulbous protrusion dorsally bearing a yellow ridge; a prominent yellow line along the margin of the wing cases and encircling the pupa anteriorly; a fine yellow line dorsally from cremaster to line around wing cases; length 15 mm, width 6 mm. Pupal duration 7 - 8 days.

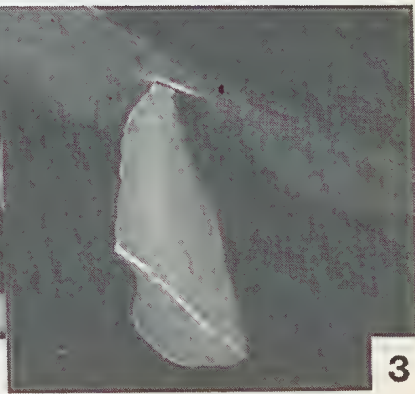
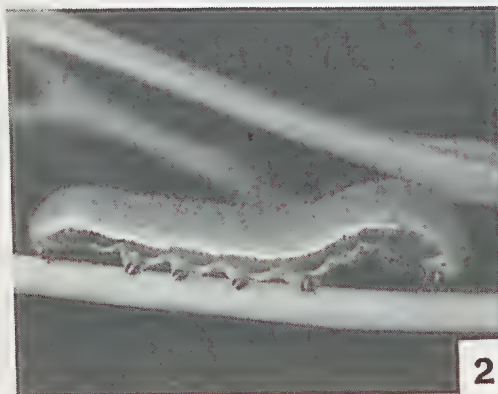
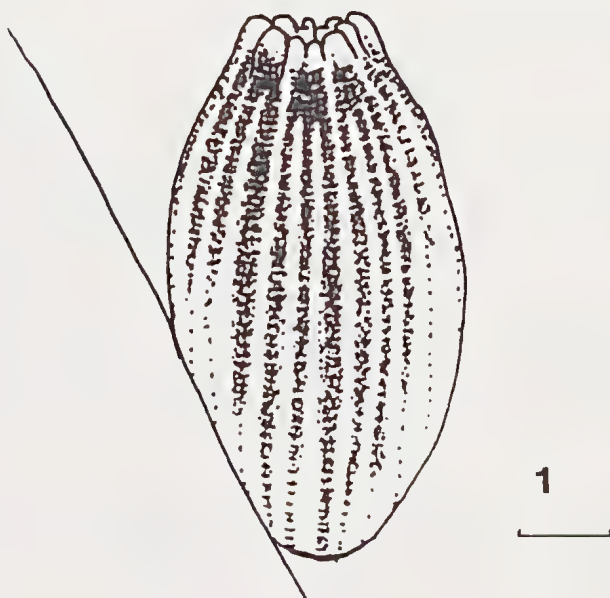
Notes

The larvae fed on juvenile foliage, and at rest, small larvae adopted a characteristic sigmoid shape remaining attached by the posterior two pairs of prolegs and having the body arched backwards with the head and thorax deflexed to touch the first pair of prolegs. Larger larvae remained more horizontal, attached by all prolegs but with the thorax and head arched vertically. When disturbed, the larvae flung themselves from the plant and dropped to the ground where they thrashed violently for several seconds before becoming motionless. They remained attached to the plant by a strong silk thread and when the disturbance had ceased, regained their position on the host plant by ascending the silk thread using forelegs and mouthparts. Pupae also lashed about vigorously when disturbed. First and early second instar larvae taken on Mt White were heavily parasitised by an unidentified tachinid fly. Several newly hatched larvae were offered fresh foliage of *Cryptocarya triplinervis* R.Br. (Lauraceae) but they did not feed and died.

Adult males exhibited aggressive territorial behaviour in selected clearings in the vicinity of the host plant. They rested on exposed twigs 4 - 6 metres above the ground and vigorously pursued most butterflies entering the clearings and then returned to rest on the same twigs. Over a three day period, many males were taken from these clearings and it was noted that successive males in a clearing often rested on the same twig that the previous males had used. Adult females were almost continuously engaged in oviposition and rarely left the host plant. The tiny eggs were inserted deep within axils on young buds and were difficult to see without the aid of a hand lens. The adults remained on the wing throughout the day and were not encountered in shaded areas.

Discussion

The finding of *C. paniculata* as the host plant of *L. g. nicevillei* in Australia is not surprising as throughout the world Libytheidae feed exclusively on plants in the family Ulmaceae (Brown and Heineman



Figs 1-3. Life history of *Libythea geoffroy nicevillei* Olliff. (1) egg, lateral view; (2) mature larva, lateral view; (3) pupa, lateral view. Scale bars (1) = 0.1 mm; (2),(3) = 10 mm.

1972, Ackery 1984). Some earlier texts list Urticaceae as host plants but these records refer to *Celtis* spp. which were formerly included in Urticaceae. The report of Carver (see D'Abrera 1977) of *Cryptocarya* (Lauraceae) and *Pometia pinnata* Forst. and Forst.f. (Sapindaceae) as host plants of *L. geoffroy* in Papua New Guinea is the only record of Libytheidae feeding on plants other than Ulmaceae. Our larvae did not eat *Cryptocarya triplinervis* casting some doubt on these records.

In northern Queensland, *C. paniculata* occurs predominantly in dry vine thickets (A. K. Irvine, pers. comm.). This habitat has not been extensively collected, which may account for the paucity of records of *L. g. nicevillei*. Coleman (1953) recorded a single female *L. g. nicevillei* from Magnetic Island but this record was not confirmed until recently. One of us (SJJ) has sighted the specimen, now in the Queensland Museum, Townsville, and confirmed the identity. It is of interest that Coleman reported sighting the female flying around a single tree on one day and returning on a subsequent day to take it as it flew around the same tree. It is possible that the tree was *C. paniculata* as this plant is known to occur on Magnetic Island (Jacks 1987).

The very small size of the egg and the heavy parasitism encountered in this observation may indicate high fecundity in female *L. g. nicevillei*. A consequence of such a reproductive strategy would be that adults could be locally common at times.

The resting posture and defence strategy of larval *L. g. nicevillei* are unusual among butterfly larvae in Australia and should aid in the recognition of this species in the field.

Acknowledgments

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